NATURALLY-OCCURRING ASBESTOS

SELF-INSPECTION HANDBOOK

What you need to know about "NOA" in California

How to control dust

How to comply with air pollution regulations

CAL/EPA AIR RESOURCES BOARD
Enforcement Division
Compliance Assistance Program

In Cooperation with Local
AIR POLLUTION CONTROL DISTRICTS

Is this Handbook for you?

This handbook is designed to help you learn about Naturally-Occurring Asbestos (NOA), why it is a problem, and what you can do about it. If you do construction, grading, road building and maintenance, quarrying, or surface mining work in areas where NOA is likely to be found, this handbook will provide information about how to comply with State regulations that apply to these activities.

Some of those to whom this handbook applies:

- Construction Workers
- Developers and Builders
- Graders and Landscapers
- Homeowners
- Project Managers
- Quarry Workers
- Road Builders and Pavers
- Surface Miners
- Swimming Pool Contractors
- Utility Companies

What is Naturally-Occurring Asbestos (NOA)?

Asbestos is the name for several types of naturally-occurring fibrous minerals that are a human health hazard when airborne. Asbestos deposits are located in many parts of California and are commonly (but not exclusively) found in areas with ultramafic and serpentine rocks, and near fault zones.

Asbestos minerals belong to either the serpentine mineral group or the amphibole mineral group. The most common type of asbestos found in California is chrysotile, a serpentine mineral.

A Naturally-Occurring Deposit of Asbestos-Containing Rock

Where is Asbestos-Containing Rock Found?

Ultramafic rocks (which typically are associated with asbestos), including serpentine (the California State Rock) have been found in 49 of California's 58 counties. They are particularly abundant in the Sierra Nevada foothills, the Klamath Mountains, and the Coast Ranges. To date, El Dorado, Lake Counties, and Placer County are the only California counties to have undergone enhanced mapping for the presence of asbestos-containing rock and soil. The California Department of Conservation has a detailed state map at:

ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/ofr_2000-019.pdf

While ultramafic rocks are more likely to contain asbestos, other types of rock sometimes also may contain asbestos.

Can I tell if material actually contains asbestos?

Magnified Image of Yellow and White Chrysotile Fibers

Asbestos fibers can be very fine and difficult to see. Appearance alone is an unreliable indicator of the presence of asbestos in rock, soil, or other material.

Only scientific testing can confirm that asbestos is actually present and accurately identify and classify the various types of asbestos.

Why is Asbestos of Concern?

When asbestos-containing rocks are crushed or broken through natural weathering processes or through activities such as construction, grading, quarrying, or surface mining, asbestos-containing dust can be generated. This dust may pose serious health risks.

Dust is a problem

Digging can cause dust, and this dust may contain asbestos

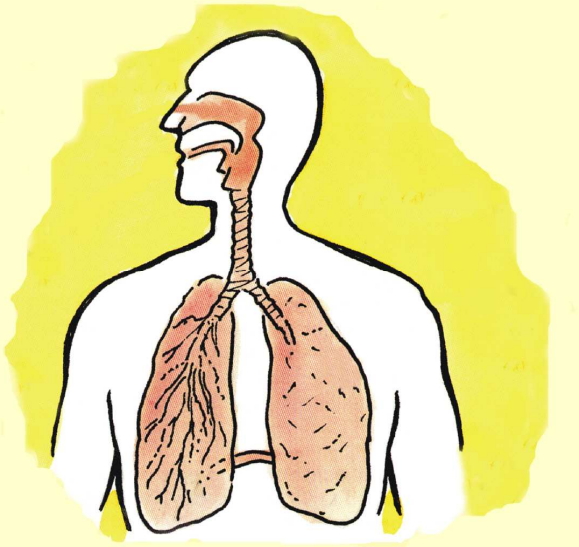
What Health Risks are Associated with NOA?

All forms of asbestos fibers can cause cancer. Any exposure to asbestos may involve some risk; therefore, there is no "safe" exposure level for asbestos.*

Inhalation is the main route of exposure. Inhaled asbestos fibers may lodge and remain in the lungs, or travel to the lining of the lungs and the abdominal cavity.

Asbestos can cause such serious diseases as:

- **Lung cancer (smoking significantly increases the risk of lung cancer if one is exposed to asbestos)**
- **Mesothelioma (a rare cancer of membranes lining the lungs, chest, and abdominal cavity)**
- **Asbestosis (scarring of lung tissues that constricts breathing), and**
- **Pleural changes (thickening and hardening of the lining that covers the lungs and chest cavity).**



Diseases caused by asbestos may not appear for twenty or more years following exposure. The degree of risk depends on how long, how much, and how frequent the exposure.

***The U.S. Department of Labor Occupational Safety & Health Administration (OSHA) has standards related to asbestos for workplace exposure at:**
http://www.osha.gov/SLTC/asbestos/standards.html

What regulations do I need to comply with?

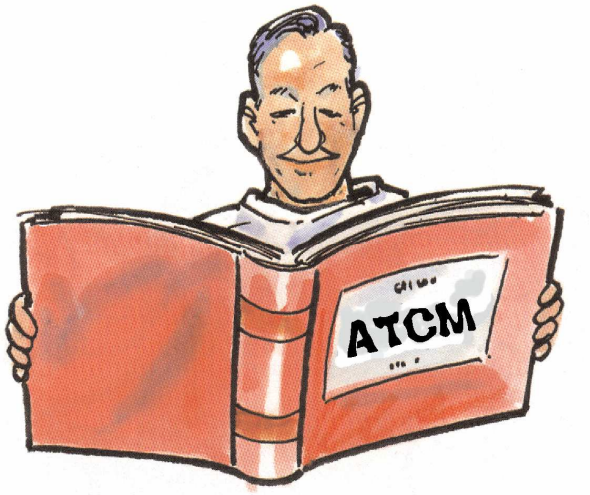
Your local Air District (APCD* or AQMD**) has primary authority to regulate your operations. **For NOA, local district regulations are based on State regulations called Airborne Toxic Control Measures or ATCMs.**

There are two separate ATCMs for activities in areas where NOA is likely to be found. One ATCM covers construction (including road construction and maintenance), grading, quarrying, and surface mining operations. The other covers the sale, supply, use, or transport of potentially NOA-containing materials for unpaved surfacing or fill.

Areas are subject to one or both of these regulations if:

- **they are identified on maps published by the California Department of Conservation as ultramafic rock units; or**
- **an air district or the owner/operator has knowledge of the presence of ultramafic rock, serpentine, or NOA on the site; or**
- **ultramafic rock, serpentine, or NOA is discovered during any operation or activity.**

Routine residential maintenance activities (mowing lawns, blowing leaves, shoveling dirt, etc.) are not addressed in the ATCMs. However, there is a potential risk of asbestos exposures from these activities. The ARB has a Pamphlet - NOA Information for Homeowners and Renters at:
http://www.arb.ca.gov/cap/pamphlets/asbestosbrochure.pdf



For the health and safety of the community, read on for key requirements of the ATCM regulations and to learn what you need to do to comply.

*__APCD:__ Air Pollution Control District
**__AQMD:__ Air Quality Management District

How do I comply with the Construction/Quarrying ATCM?

For *any* kind of construction, grading, quarrying, or surface mining activity:

► *Control dust*

► *Prevent visible emissions crossing the project boundaries**

Dust control measures should be used for:

- **Public and non-public roads**
- **Disturbed areas**
- **Material handling**
- **Trackout**
- **Active or inactive storage piles**
- **Earthmoving activities**
- **On- and off-site transport of materials**
- **Post-construction areas**

Road construction and maintenance projects

► Notify the local air district in writing 14 days before any work begins.

Construction and grading projects

► Control dust and visible emissions.

► Projects *more than one acre* - prepare and obtain air district approval for an *asbestos dust mitigation plan*.

- **Plan must specify emissions minimization and dust control measures.**
- **Plan must be implemented within 14 days of district approval.**

Quarries and surface mines

► Prepare and obtain air district approval for an *asbestos dust mitigation plan*.

- **Plan must address specific emission sources such as crushers, grinding mills, screening operations, and transfer points on belt conveyors.**

► Mining operations may need local air district stationary source permits, and meet specific visible emission standards for equipment.

The ATCM has specific *recordkeeping and reporting* requirements. In addition, the local air districts may require air monitoring. These are the responsibility of the owner.

***Project Boundaries** means the right-of-way and any construction easements adjacent to and necessary for the purposes of a specific road construction project or maintenance activity.

Are there any exemptions in the Construction/ Quarrying ATCM?

Exemptions from some or all of the requirements of the ATCM may be allowed, *under certain conditions*, for the following:

- **A registered geologist determined that no serpentine or ultramafic rock is likely to be found in the area to be disturbed.**
- **Agricultural operations or timber harvesting except for construction of roads and buildings.**
- **Covered activities by homeowners and tenants on residential property they own or occupy are exempt from some sections.**
- **Crushing, screening and conveying operations, stockpiles, and off-site material transport at a sand and gravel operation if the operation processes only materials from an alluvial deposit.**
- **Emergency road repairs necessary for a firebreak or due to a landslide, flood, or other emergency or to mitigate a condition that constitutes and imminent hazard to the public.**
- **Remote locations (at least one mile from a receptor such as: hospital, school, day care center, work site, business, residence, or permanent campground).**

Remember, in all cases, local air district requirements may be more stringent. Contact your local air district (see back cover for contact information) to confirm requirements and exemptions for your projects.

For more information on the Construction/Quarrying ATCM including conditions for exemptions see:

- **http://www.arb.ca.gov/toxics/atcm/asb2atcm.htm**

What kinds of dust control measures are available?

On-Site Traffic

Keep site wetted down

A site kept adequately wetted is much less likely to produce potentially-hazardous asbestos-containing dust. But, avoid over watering and non-stormwater discharges.

Limit speed to 15 m.p.h. or less

Moderate vehicle speed helps to keep dust to a minimum.

On-Site Roads Open to the Public

Pave with asphalt or concrete

Heavy vehicles pulverize the surface material and create a constant source of dust. Where cost is a factor, pave just the entrance and exit to minimize sediment tracking, and cover the remainder with asbestos-free rock or cobbles to reduce the amount of surface dust.

Treat with an environmentally-safe dust suppressant
Dust suppressants* offer certain advantages over water, such as reduction in frequency of application.

***An acceptable dust suppressant** is any vegetation, moisture-attracting material, or non-toxic chemical soil stabilization material not prohibited for use by the county, the Regional Water Quality Control Board, the California Air Resources Board, the United States Environmental Protection Agency, or any other law, rule or regulation. Contact your local agency for additional information.

Note: The ATCM does not specify the use of any particular chemical dust suppressants.

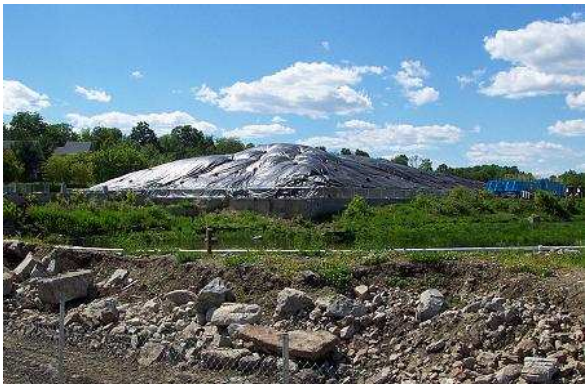
Cover with non-asbestos materials
A layer of asbestos-free rock/cobbles forms a barrier between asbestos-containing material and the ambient air.

Active Stock / Storage Pile Used Within 7 Days

Keep adequately wetted
Where water is reasonably plentiful, it may be the wetting agent of choice. Keep sufficiently moistened but avoid over watering and non-stormwater discharges.

Cover with tarp

When not in use, a physical cover may be placed on the piles. Limit the working face of the pile to the lower edge.



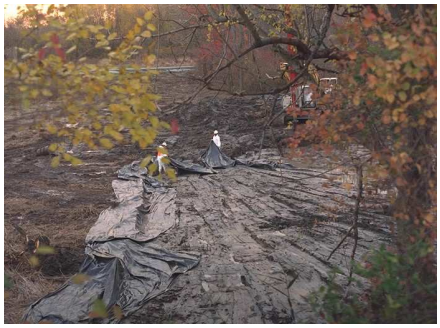
Disturbed Surface Areas and Inactive Storage Piles Undisturbed for More than Seven Days

Apply environmentally-safe dust suppressants or chemical stabilizers

These will keep the piles stable, without the need for a physical barrier.

Cover with tarp or vegetative cover

Either method will provide an effective barrier to prevent wind-borne material dust. Tarp over during summer. If pile is to remain through rainy season, consider vegetative cover.

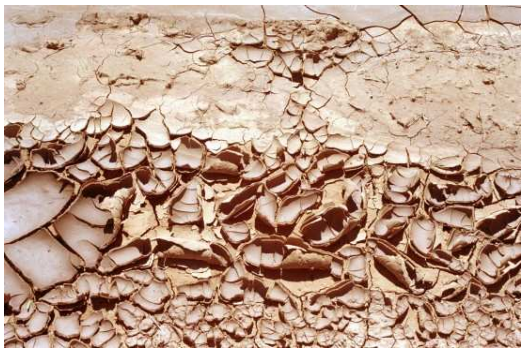


Install wind barriers

Walls of this sort form a physical barrier that protects entire areas of the work or storage site, rather than just the material pile.

Maintain a crust

In some soils, little more than a generous sprinkling of water may be required to allow the material to form a crust upon drying.



Apply water

Keeping the surface adequately wetted helps to prevent the formation of dust. But, avoid over watering and non-stormwater discharges.

Earthmoving Activities

Pre-wet soils and re-apply water

Here again, the water aids in the prevention of dust formed from earthmoving activities.

Use an acceptable dust suppressant

Environmentally-friendly chemicals can suppress dust for a much longer period than can water alone.

Suspend work on windy days
High wind speeds can mobilize sand, silt, and dislodge clay particles despite the use of dust control measures.

Material Handling

Water spray bars on conveyors
With water spray bars or misters in place, dust is much less likely to form as the material falls from the conveyor.

Shrouds on drop points
A shroud greatly improves control of the material being dropped, and limits the formation of dust. Most emissions come from loading the pile. Keep the drop height low to reduce dust, and keep the ground at the base of the pile clear of spills.

Keep materials moist during excavation, grading and truck loading
Persistent wetting holds down dust.

On-Site and Off-Site Transport of Material

Ensure no spillage can occur from holes or other openings in cargo compartments
This is a matter of proper maintenance of the vehicles used.

Ensure that loads are adequately wetted and either tarped or loaded with 6 inches of freeboard
Keep pile sufficiently moistened with water but avoid over watering such that water is dripping out of the truck.

Freeboard is the distance from the top of the material storage section of the truck trailer to the top of the material load at its highest point.

Track-Out Prevention and Removal

Rock/cobble pad

This is a non-mechanical solution that allows dust and other material to be removed from truck tires efficiently.

Tire shaker

Dust and mud are shaken loose as the truck tires go over the shaker plates. This is an inexpensive system, and does not require mechanical operation.

HEPA filter vacuum

This may be a good method for removing dust from paved public roads or track-out. This equipment may require a permit to operate. Check with your local air district.

Wheel wash system

This is an efficient means of preventing sediment tracking on roads. System must be designed to manage water and soil flows once they are cleaned from the wheels.

Wet sweeping

In California, wet sweepers must be PM10 efficient. PM10 is particulate matter 10 micrometers in aerodiameter or smaller. These particles can cause health problems when inhaled, even if they do not contain asbestos.

Post-Construction Stabilization

Establish and maintain a vegetative cover

When long-term storage is planned, vegetation is the most effective and economical means of stabilizing soil.

Cover with at least 3 inches of non-asbestos material

The non-asbestos material provides an effective barrier to wind, traffic, and other disturbances that could raise asbestos-containing dust.

How do I comply with the Surfacing ATCM?

The use, sale, and supply of restricted material* is prohibited for surfacing unless it has been tested and determined to have an asbestos content less than 0.25 percent or an exemption is met (see next page).

For all restricted material sold or supplied for surfacing applications, the seller must provide a *written receipt* that lists the amount of material sold or supplied, and a statement that the asbestos content of the restricted material is less than 0.25 percent. Producers also need to provide dates the restricted material was sampled and tested, or verification that the material is exempt.

The written receipt for sale or supply of restricted material for non-surfacing applications must contain the following statement:

> **WARNING!**
>
> **This Material May Contain Asbestos.**
>
> **It is unlawful to use this material for surfacing or any application in which it would remain exposed and subject to possible disturbances.**
>
> **Extreme care should be taken when handling this material to minimize the generation of dust.**

There are specific *recordkeeping* requirements for persons who transport, supply, or sell restricted material, or who use restricted material for surfacing. There also are specific *reporting* requirements for persons who sell, supply, or offer restricted material for sale.

Finally, the surfacing ATCM also specifies *sampling and testing* requirements for rock or materials that might contain NOA.

There is a flow chart on page 19 that explains how to comply with the Surfacing ATCM.

*__Restricted material__ includes ultramafic and serpentine rocks; any material extracted from a region defined on geologic maps as an ultramafic rock unit; and any material that has been tested and determined to have an asbestos content that is 0.25 percent or greater.

Are there any exemptions in the Surfacing ATCM?

The use, sale, and supply of restricted material are prohibited, unless one of the specified exemptions applies.

***Under specified conditions*, exemptions are provided for:**

- **Sand and gravel operations operating in alluvial deposits (deposited by flowing water, as in a riverbed, flood plain, or delta);**
- **Roads located at quarries or mines;**
- **Maintenance operations on existing roads;**
- **Emergency road repairs;**
- **Asphalt and concrete materials;**
- **Landfill operations;**
- **Geologic evaluation;**
- **Limited access surfaces;**
- **Surfacing applications in remote locations;**
- **Roads located at construction sites; and**
- **Riprap assemblage of large stones along a watercourse or shoreline to prevent erosion or provide stability.**

Remember, in all cases, local air district requirements may be more stringent. Contact your local air district (see back cover for contact information) to confirm requirements and exemptions for your projects.

For more information on the Surfacing ATCM including conditions for exemptions see:

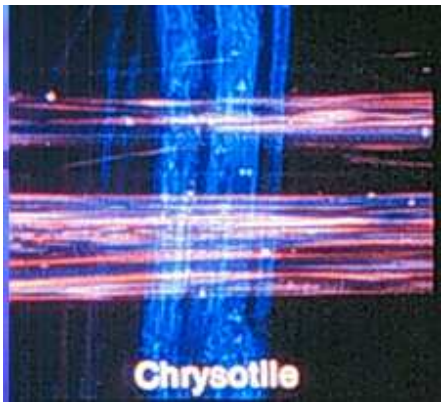
- **http://www.arb.ca.gov/toxics/atcm/asbeatcm.htm**

Is an Asbestos Test Method Available?

The Air Resources Board has developed a test method to determine the percentage of asbestos contained in a rock pile or a gravel surface. ARB Test Method 435 can be used to obtain bulk material samples from three types of sources:

- **Aggregate in storage piles,**
- **Aggregate on conveyor belts**
- **Aggregate on surfaces such as roads, shoulders, and parking lots.**

An asbestos testing laboratory may be able to conduct this test*. The detection limit of the current test method is 0.25%, and the asbestos content must be less than this percentage.



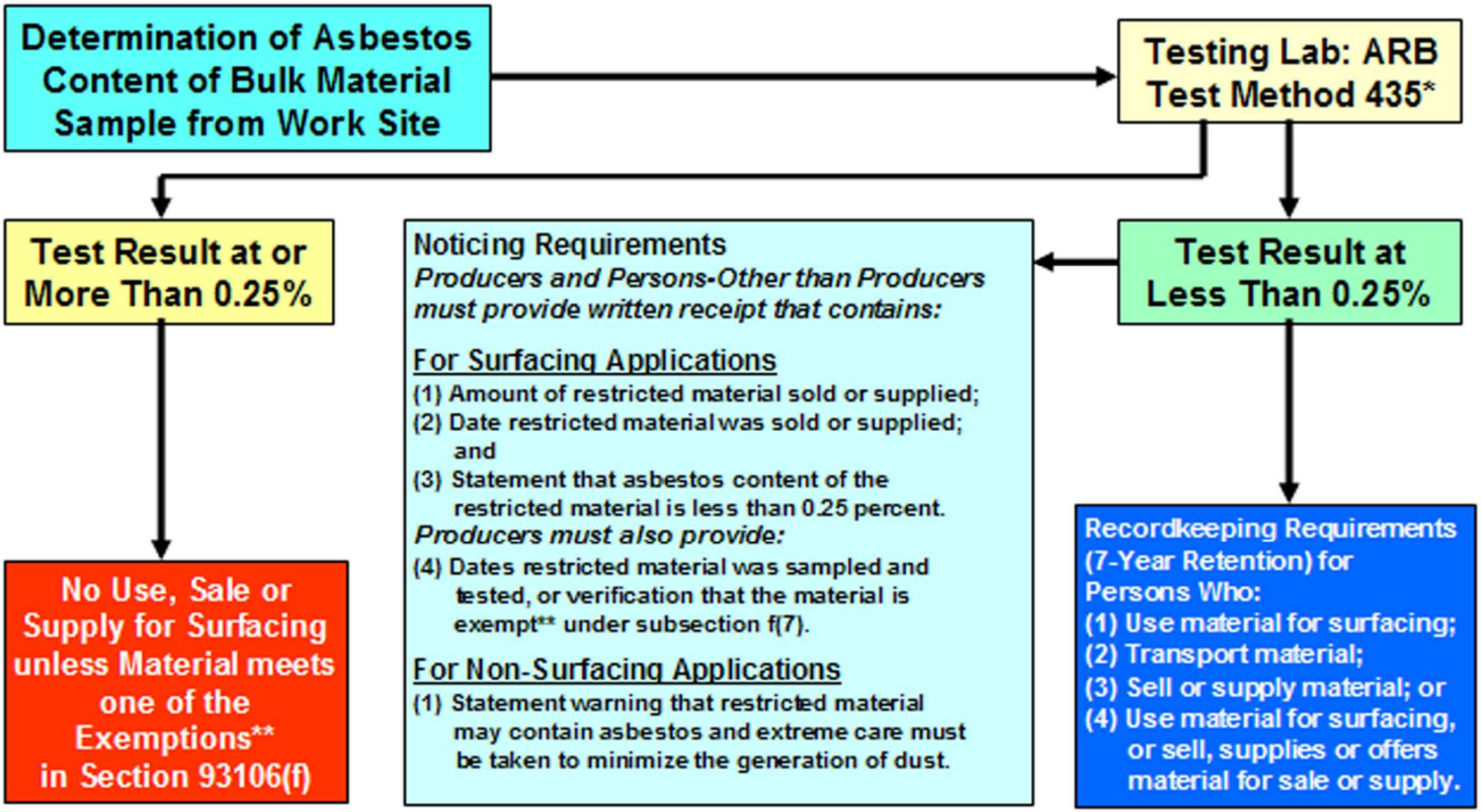
Testing for asbestos content

Are There Other Requirements?

The surfacing ATCM also explains the air district's authority to require a geologic evaluation for the presence of rocks that may contain asbestos and to require testing of any bulk material for its asbestos content. This authority might be used if credible evidence indicates the potential presence of asbestos outside of a mapped area of ultramafic rocks.

***More information can be found at:** http://www.arb.ca.gov/toxics/asbestos/5monitor.pdf

How to comply with Surfacing Material Requirements



*The ARB Test Method 435 does not calculate the percentage weight of the rock directly. Rather, it uses point counting, a standard technique for determining the relative areas occupied by separate minerals in thin sections of rock.
**The Surfacing ATCM provides 11 different exemptions. The exemptions are summarized on page 17 and listed on the ARB website at: hhtp://www.arb.ca.gov/toxics/atcm/asbeatcm.htm

Use a Do-It-Yourself Inspection Checklist

Using a Checklist as part of your pre-job planning helps you incorporate the routine tasks of dust control into your daily schedule and limit the danger of naturally-occurring asbestos. It serves as a job reminder on a daily basis, and as a record of your efforts to keep dust problems to a minimum. You can identify problem areas before they get out of hand, and anticipate making adjustments for seasonal changes or for any unforeseen circumstances. **Your personal involvement in reducing asbestos-containing dust will help us all breathe a little easier!**

Prevention

- √ Limit Surface Area Disturbed
- √ Limit Work in Wind
- √ Apply Suppressives as Needed
- √ Clean Up Spills Immediately

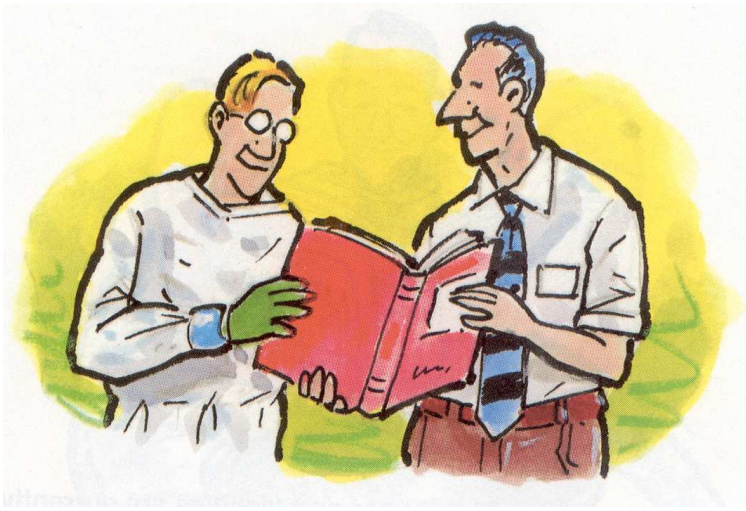
Occasional Use Areas

- √ Grow Groundcover
- √ Erect Windbreaks
- √ Apply Crust Chemicals

Frequent Use Areas

- √ Pave Roads
- √ Enclose Storage Areas
- √ Cover Stockpiles
- √ Water Often
- √ Reduce Speed Limits
- √ Minimize Trips
- √ Limit Area Access
- √ Prevent Track-Out

√√ Use Your Pre-job Plan Checklist Daily!



Pre-job Planning Inspection Checklist

Week of _____ to _____ Year: _____

Item	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Notes
On-Site Traffic								
Speed Limit Signage								
Wetting								
On-Site / Public Roads								
Cover with Rock/Cobble								
Paving								
Treat with Dust Suppressant*								
Active Stock / Storage Piles								
Cover with Tarp								
Wetting								
Disturbed Surface Areas and Inactive Storage Piles								
Apply Dust Suppressant*								
Cover with Tarp or Vegetation								
Install Wind Barriers								
Maintain Crust								
Wetting								
Earthmoving Activities								
Apply Dust Suppressant*								
Pre-Wet								
On-Site and Off-Site Transport								
Cover and Wet								
No Leaks								
Track-Out Prevention								
Rock/Cobble Pad								
HEPA Vacuum								
Tire Shaker								
Wet Sweeper								
Wheel Wash								
Material Handling								
Keep Materials Wet								
Shrouds on Drop Points								
Water Spray Bars on Conveyers								
Post-Construction Stabilization								
Cover with Vegetation								
Cover with 3 Inches Non-asbestos-containing Material								
Paving								

*Ensure Material Safety Data Sheet (MSDS) is available on site for dust suppressant and follow manufacturer's recommendation.

List of Web-Addresses for More Information

1. **Air Resources Board (ARB) - Naturally-Occurring Asbestos (NOA):**
   http://www.arb.ca.gov/toxics/asbestos/asbestos.htm

2. **Asbestos Construction and Quarrying Air Toxic Control Measure (ATCM):**
   http://www.arb.ca.gov/toxics/atcm/asb2atcm.htm

3. **Asbestos Surfacing ATCM:**
   http://www.arb.ca.gov/toxics/atcm/asbeatcm.htm

4. **Office of Environmental Health Hazard Assessment - Asbestos Fact Sheet:**
   http://www.oehha.ca.gov/air/toxic_contaminants/Asbes_F.html

5. **Agency for Toxic Substances and Disease Registry (ATSDR) - Public Health Statement for Asbestos:**
   http://www.atsdr.cdc.gov/ToxProfiles/phs61.html

6. **Occupational Safety & Health Administration (OSHA) - Asbestos Standards:**
   http://www.osha.gov/SLTC/asbestos/standards.html

7. **California Geological Survey - Asbestos:**
   http://www.consrv.ca.gov/cgs/minerals/hazardous_minerals/asbestos/index.htm

8. **California Department of Conservation - State map of NOA areas:**
   ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/ofr_2000-019.pdf

9. **U.S. Environmental Protection Agency - EPA's Asbestos Home Page:**
   http://www.epa.gov/opptintr/asbestos/

10. **ARB Fact Sheet - Monitoring for Asbestos:**
    http://www.arb.ca.gov/toxics/asbestos/5monitor.pdf

    NLVAP Directory of Accredited Laboratories - PLM
    http://ts.nist.gov/ts/htdocs/210/214/scopes/plmtm.htm

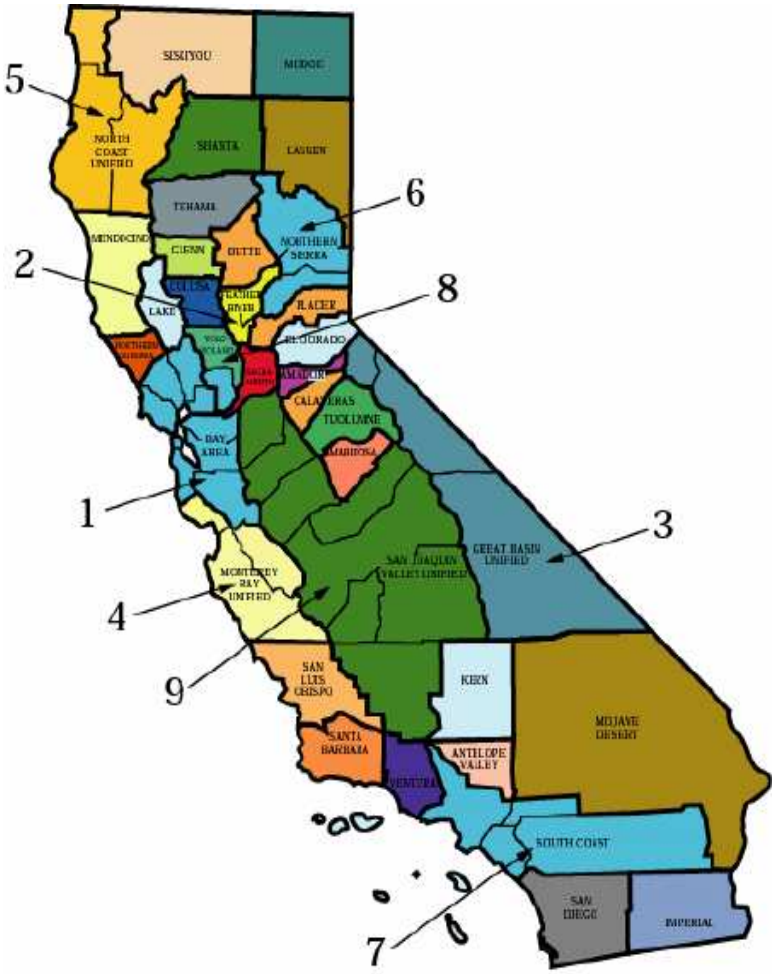
    NLVAP Directory of Accredited Laboratories - TEM
    http://ts.nist.gov/ts/htdocs/210/214/scopes/temtm.htm

11. **ARB Test Method 435:**
    http://www.arb.ca.gov/toxics/asbestos/meth435.pdf

12. **ARB Pamphlet - NOA Information for Homeowners and Renters:**
    http://www.arb.ca.gov/cap/pamphlets/asbestosbrochure.pdf

Need More Information?

Air Resources Board (800) 952-5588 **District: _____**



Multi-County Air Districts

1 - Bay Area (415) 749-5000
2 - Feather River (530) 634-7659
3 - Great Basin (760) 872-8211
4 - Monterey Bay (831) 647-9411
5 - North Coast (707) 443-3093
6 - Northern Sierra (530) 274-9360
7 - South Coast (909) 396-2000
8 - Yolo-Solano (530) 757-3650
9 - San Joaquin Valley (559) 230-6000

County Air Districts

Amador (209) 257-0112
Antelope Valley (661) 723-8070
Butte (530) 891-2882
Calaveras (209) 754-6504
Colusa (530) 458-0590
El Dorado (530) 621-6662
Glenn (530) 934-6500
Imperial (760) 482-4606
Kern (661) 862-5250
Lake (707) 263-7000
Lassen (530) 251-8110
Mariposa (209) 966-2220
Mendocino (707) 463-4354
Modoc (530) 233-6419
Mojave Desert (760) 245-1661
No. Sonoma (707) 433-5911
Placer (530) 745-2330
Sacramento (916) 874-4800
San Diego (858) 586-2600
San Luis Obispo (805) 781-4247
Santa Barbara (805) 961-8800
Shasta (530) 225-5789
Siskiyou (530) 841-4029
Tehama (530) 527-3717
Tuolumne (209) 533-5693
Ventura (805) 645-1400

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http://www.arb.ca.gov/training/training.htm

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